
Rethinking the Political Economy of Industrial Policy

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Industrial policy has long been used by developing countries to promote industries through broad import substitution industrialization efforts. Much of this effort has been criticized as leading to inefficient and uncompetitive firms. Recent work on new industrial policy, however, particularly in the context of the rise of China, has emphasized the importance of knowledge spillovers, green industrial efforts, global value chains, and the entrepreneurial state as key elements for success. Following a review of the rationale for state intervention, this article focuses primarily on the role of political factors that influence the effectiveness of industrial policy. Specifically, we identify key international drivers and constraints, domestic state-society relations, and elite ideological commitments to evaluate the likelihood of conducting successful industrial policy.

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JEL Classification: F5; F13; H5; L5

1. INTRODUCTION

The «Great Recession» of 2007-2009 catalyzed new thinking about industrial policy (IP) following governments' efforts to stimulate their economies. Although these interventions were broadly focused on restoring growth, this intervention has also defied WTO non-discrimination rules and has led to

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calls for trade retaliation (Deaglio 2008; Aggarwal and Evenett 2010; Zanetti 2010; Warwick 2013; Mazzucato *et al.* 2015). With the COVID-19 crisis of 2020, massive state intervention to fend off recession has once again posed questions about the role of the state in promoting growth through sectoral intervention by governments (Bianchi *et al.* 2023; Di Tommaso *et al.* 2022; Cherif 2021; Ferrannini *et al.* 2021; Saad-Filho 2021; Arrighetti *et al.* 2021; Di Tommaso 2020; Cresti *et al.* 2020). More recently, the rise in inflation and the energy shock from the Ukraine war has also led to efforts to promote industrial restructuring through activist government policies. In addition, the increasingly tense competition between the US and China – with concerns about the vulnerability of supply chains – has also led to a rethinking of industrial policy. This article provides an analytical survey of evolving thinking about industrial policy, with the specific goal of examining the political drivers and constraints on industrial policies from an international, domestic, and ideational perspective.

Arguments about the appropriate role for governments with respect to the market are hardly new, with early advocates calling for a significant state role in helping countries to catch up with their more advanced counterparts¹. In the contemporary era, political economists including Chalmers Johnson (1982), Frederic Deyo (1987), Bruce Cummings (1984), and Stephan Haggard (1990; 2004), among many others, have focused on the policies of the East Asian «tigers» and examined the role of the state to promote development through IP (Haggard 1990; Haggard 2004). Economists such as Dani Rodrik have also discussed the rationale for state intervention, focusing on market failures and others such as Justin Lin and Ha-Joon Chang have debated the type of industrial policy strategies that countries might pursue. But by and large, most economists from the Anglo-Saxon countries have historically been skeptical of arguments supporting industrial policy, as reflected in the work of Howard Pack and Kamal Saggi (2006), who argue that governments are likely to be poor at picking winners and are subject to regulatory capture (Rodrik 1996; 1998; Lin and Chang 2009; Di Tommaso and Tassinari 2017). Resolving this debate is hardly a simple matter, and as analysts have noted, the lack of our ability to consider counterfactuals makes it problematic to assess the benefits or costs of particular industrial policies with any certainty.

More recent work on the entrepreneurial state in Europe makes the case for intervention in emerging industries, such as green technology, and co-creating markets with the private sector (Mazzucato 2018; Bianchi, 2018). Resolving the tension regarding the effectiveness of IP is hardly a simple matter.

¹ See the historical discussion in: Chang (2003); Di Tommaso and Schweitzer (2013); Mosconi (2015); Di Tommaso and Tassinari (2017); Di Tommaso *et al.* (2021).

Some have argued that in the post-financial and COVID-19 crisis era, non-interventionist economic policy is insufficient to drive industrialization and upgrading in the developing world (Milberg *et al.* 2014). This focus on «new» industrial policy builds upon previous models of import substitution industrialization (ISI) and later East Asian export-oriented growth, adapting IP to meet the challenges of an increasingly fragmented and dynamic global economy (Weiss 2018; Bianchi *et al.* 2023; Di Tommaso 2020).

This new interest in IP has been driven by several developments. First and foremost, the rise of China, a country which has pursued active IP, has been seen as a model by some countries. Second, in developed countries, concerns about deindustrialization and claims about the benefit of promoting «green industries» have driven the IP debate. Third, with respect to developing countries, the value of creating economic clusters, dynamic learning and spillover, and the importance of inserting themselves in global supply chains has bolstered an interest in IP. In addition to such goals, there has also been a focus on new tools of intervention, including government procurement, general standard setting, and the use of government pressure on companies to secure intellectual property to bolster specific sectors. Fourth, the evolution of the WTO over the last 15 years has also led analysts to explore the extent to which international and regional institutions might restrict the ability of countries to pursue IP. The current phase is characterized by a convergence of structural forces – for example, the climate crisis, automation in manufacturing and AI, the COVID-19 pandemic – that require increased coordination through IP in general².

Does the recent IP debate fundamentally change the rationale for intervention? Are the new tools of intervention radically different from those we have seen before? Is the new IP easier to implement than import substitution industrialization that marked the economic policies of most developing countries from the 1950s to the early 1980s? And what constraints are countries likely to face if they try to pursue IP? By reviewing both the old and new claims about IP, and by focusing in particular on the political economy of IP, the goal of this article is to provide an analytical survey of the current lay of the land and better understanding of the political constraints on the pursuit of IP.

The article is organized as follows: Section 2 provides a typology of the existing rationales for government intervention: economic market failures, political goals, and firm rent-seeking. Section 3 examines the variety of policy packages and tools that governments might use to intervene in the market. These include macroeconomic policies, horizontal policies, and vertical

² Thanks to the anonymous reviewer for this suggestion.

sectoral policies. Sections 4 through 6 then turn to an examination of the *political* facilitators and constraints that countries face in efforts to implement IP. In terms of *facilitators*, we can identify three levels of analysis – namely international threats, domestic state autonomy, and intellectual consensus among policy makers. At the same time, as discussed in Section 4, in a dynamic international policy environment, the evolution of the WTO, the creation of regional agreements such as the EU, and the recent flurry of bilateral agreements can all *constrain* policymakers’ leeway in implementing IP.

Section 7 concludes with some lessons about the use of IP in view of both the theoretical claims and historical experience of a variety of countries examined in the various sections of this report. The main lessons that emerge are that the pursuit of IP is a complex matter, both from an economic and political standpoint. As we argue, although some countries such as the East Asian newly industrializing countries and China have experienced a significant degree of success in their use of industrial policy, the relatively stringent economic and political requirements for success not bode well for sector specific industrial targeting in most countries without efforts to improve government capacity to design and implement policies.

2. THE RATIONALE FOR STATE INTERVENTION

Debates over industrial policy have raged for decades, and yet there has been little consensus on the drivers of success in these policies. Early industrial policy debates focused on the role of the government in «fast tracking» structural change, or «leapfrogging» in the case of developing countries adopting technology from advanced economies (Gershenkron 1952; Chang 2009; Di Tommaso and Tassinari 2017; Cardinale and Scazzieri 2020; Di Tommaso *et al.* 2021; Bianchi *et al.* 2023). Traditional industrial policy strategies, such as ISI, rose to popularity in less developed economies in Latin America, much of Asia, and most of Africa beginning in the 1950s (Baer 1996; Kingstone 2011). Although these countries were able to sustain growth, the contrast between the rapid growth of the newly industrializing countries in East Asia in the 1980s when compared to India, most Latin American countries, and African countries, bolstered the position of those arguing for free market export oriented industrial (EOI) policies and discounting the role of industrial policy – even though many of these EOI policies themselves were a product of industrial policies (Prebisch 1950; Williamson 1990; Rodrik 1998).

After the 2008 financial crisis, it also became readily apparent that developed countries had actively engaged in sectoral intervention – rather than

simply engaging in macroeconomic stimulus³. While Japan, France, and Germany (among others) already were pursuing industrial policy, the 2008 financial crisis led to an outright reversal to anti-interventionist thinking. As a result, there has been a revived interest on the suitable role for the state.

Intellectually, the revival of IP has been driven by five important strands of thinking. The first reflects a concern among analysts of developed countries about the deindustrialization of their economies⁴. Exponents of this so-called new thinking include Gary Pisano and Willy Shih (2012) who expressed concern about the outsourcing of not only basic products but of sophisticated ones as well. As Pisano and Shih argue, because the manufacturing process is a factor in developing new high-tech innovation, advanced economies should worry about losing their industrial commons. Michael Spence (2011) took up the same themes, focusing on the need to promote new technologies to increase the number of manufacturing jobs. Yet many of these ideas, which some see as an original contribution, are hardly new. Indeed, when Stephen Cohen and John Zysman published their book *Manufacturing Matters* in 1987, most economists dismissed their concern about the importance of the manufacturing sector as archaic thinking (Cohen and Zysman 1987). Moreover, the very basis of ISI was to promote manufacturing to decrease reliance on commodity exports.

Second, the widespread concerns about environmental degradation became linked to an interest in promoting the manufacturing of environmental goods as a basis for the reindustrialization of the developed countries. This theme gained traction both in the US as well as in Japan and Europe. Yet, the Chinese have actually moved more quickly than developed countries in the promotion of green industries.

Third, an interest in clusters, as seen in the dramatic success of Silicon Valley, and the participation in global supply chains have been seen as a path to development and became a theme of IP⁵. Here again, the question of how novel these arguments are, and to what extent they provide a new rationale for IP has been subject to extensive debate.

Fourth, COVID 19, the Ukraine war, and increasing geopolitical tensions have prompted a debate on the security of supply chains. Whereas previously global supply chains followed the logic of pure economic efficiency, the

³ See Aggarwal and Evenett (2010; 2012) on sectoral intervention in the wake of the financial crisis of 2008.

⁴ See the excellent overview of this debate, particularly in the European context by Owen (2012), Section 4.

⁵ Although clusters like Silicon Valley are not entirely unproblematic see Kwon and Sorenson (2021) and Etzkowitz (2021).

TAB. 1. *Rationale for state intervention*

Rationale for intervention	Dynamics of State Intervention		
	1) <i>Specific concerns</i>	2) <i>Government responses (policies and instruments)</i>	3) <i>Possible problems with intervention</i>
<i>Market failures</i>	<ul style="list-style-type: none"> – Imperfect market – Dynamic scale economies – Technology externalities, coordination failures, and incomplete information 	<p><i>Responses:</i> Horizontal or sectoral policies (market following or leading)</p> <p><i>Measures:</i> trade measures, SOEs, subsidies, tax benefits, regulation, government procurement</p>	Governmental failure owing to lack of knowledge or capture
<i>Economic and political goals</i>	<ul style="list-style-type: none"> – Income distribution – International security – State rent seeking – Environmental 	<p><i>Responses:</i> Horizontal or sectoral policies (market following or leading)</p> <p><i>Measures:</i> trade measures, SOEs, subsidies, tax benefits, regulation, government procurement</p>	Conflicts among groups, capture in the name of «security», retaliation by other countries, predatory state
<i>Firm rent seeking</i>	Secure protected market to avoid competition, either foreign or domestic or to increase competitiveness through state intervention	<i>Measures:</i> Tariffs, quotas, SOEs, subsidies, tax benefits, regulation	Misuse of government intervention creates inefficiencies

Source: Authors. Adapted from S. Aggarwal (2013).

vulnerability of these networks has encouraged countries to increasingly promote onshoring and friend-shoring as a response.

Fifth, given the recent and dramatic external shocks discussed above, the need for governments to pursue industrial policy is now a given. The industrial policy debate has shifted from whether industrial policy should be pursued to how the government ought to pursue these policies most effectively. It is imperative to compare the various use cases of industrial policy thus far and separate the approaches that ameliorated these issues through the use of industrial policy (see for instance Rodrik and Mazzucato 2023; Kastelli *et al.* 2023). Table 1 provides an overview of our approach, focusing on several elements that help in better characterizing the essential aspects of each of these approaches. Column 1 considers the specific content of the overarching rationale for government policy. Column 2 considers how governments might respond to these specific objectives, with both a general approach and illustrative examples of instruments. Column 3 then looks at possible problems that might occur as a result of government intervention.

We propose three main categories of rationale for the use of industrial policy: market failures; political and economic goals; and rent seeking by firms.

2.1. *Economic market failures*

Economic market failures are the dominant rationale for why IP might be appropriate. Standard economic theory on imperfect markets and factor market issues are well known. Somewhat newer issues concern the importance of imperfect markets, dynamic scale economies, technology externalities, coordination failures, and incomplete information. Our goal is not to be comprehensive on each of these elements but to point to their central claims⁶.

2.1.1. *Imperfect market*

A key rationale for intervention to correct market failures focuses on imperfect markets. As economists have generally claimed, any deviation from a competitive market is likely to lead to a loss of consumer welfare and generate market inefficiencies⁷. Thus in the case of monopolies or oligopolies, state intervention to break up firms through legal measures, or regulatory efforts to lower barriers to entry to facilitate efficient functioning of the market or to deter collusion by increasing competition may be called for.

Indeed, the dominant theme in American industrial policy toward the end of the 19th century and early 20th century revolved around «trust busting» – the creation of antitrust laws and anti-collusive statutes to prevent excessive industrial concentration. This approach has since enjoyed a revival in the US with the appointment of neo-Brandeisians to key political positions. In the case of the EU, beginning in the 1980s, the emphasis shifted away from nationalization of industry in both the UK and France, toward a focus on privatization and increasing competition through cross-border flows of trade and investment as a result of the common market (Owen 2012). More generally, in many developing countries and emerging markets, privatization of former nationalized industries has often led to the replacement of state monopolies with private monopolies or duopolies. Thus, the creation of suitable rules and regulations to encourage competition and encourage efficiency should be viewed as an important form of «industrial policy».

⁶ Pack and Saggi (2006) discuss some key aspects of several of the factors noted in this section. Their treatment is not entirely systematic and thus the discussion here, which draws heavily on S. Aggarwal (2013) incorporates ideas from Haggard (2004) and Lin and Chang (2009).

⁷ See Glykou and Pitelis (2011) for a discussion of industrial policy and imperfect competition.

2.1.2. *Dynamic economies of scale*

An important motivation for IP is its ability to solve capital market failures in the context of dynamic scale economies. Krugman sees this return to the insights of development economists like Hirschman as a result of their ideas being incorporated in «a form of rigorous [mathematical] model» (Krugman 1995). This line of thinking argues that nascent domestic industries cannot bear the high cost of investment and international competition, so state-led help and protection against foreign imports are necessary to encourage development. The basic claim is that through economies of scale that lower per unit costs with expanding production, these industries could be internationally competitive⁸. Although it may appear that an industry lacks competitive advantage at the time, there could be an advantageous endowment structure that would lead to success in the long run. Connected to this argument is the idea that ideally, while financiers should be able to recognize such dynamic arguments, they too may be unwilling to do so, in part because of incomplete information⁹.

2.1.3. *Technology and knowledge externalities, coordination failures, and incomplete information*

Arguments about the need to promote nascent industries are often tied to claims about technological externalities or knowledge spillovers as a result of the formation of human capital. Some industries may be particularly desirable because they lead to widespread diffusion to other sectors of the economy. For example, the US Defense Department's support to create the Internet is an example of the «public goods» aspect of investment where private firms may not have a strong incentive to invest in light of possible free riding (Pack and Saggi 2006, 273).

Technological innovation may require government intervention because there otherwise would be a lack of investment. Such innovation can easily diffuse, deterring potential investors who fear that they will not be able to capture the sunk costs of new technology. Consequently, technologically-focused products may suffer from a lack of investment owing to this first-mover disadvantage. Moreover, because economic growth comes with significant capital requirements, increased scale of production, and rapid market growth, such improvements must be accompanied by improved educational,

⁸ It is worth noting that some industries are more scale intensive than others (e.g. auto manufacturing, utilities, software) with some industries being largely not scale intensive.

⁹ See a summary of the arguments in Rodrik (2013).

legal, and financial institutions, as well as better infrastructure. In addition, production of a new technology requires extensive sunk costs that firms may be unwilling to undertake without government intervention – «once a firm commits to a particular technology, it cannot switch to another technology without big costs – even when changes in the environment are such that a firm would have adopted a new technology» (Chang and Andreoni 2020, 5). Under these conditions, the government can reduce the uncertainty of a technology’s success for a firm through guaranteeing demand or making the technology a focal point around which other firms should coordinate (Chang and Andreoni 2020). The inability or unwillingness of individual firms to single-handedly bring about such changes may thus result in market failure.

Technology may also suffer from coordination failures because of the difficulty of upstream and downstream industries to coordinate their investments. While it may be individually unprofitable to produce computers or software, if private firms in these two sectors invest somewhat simultaneously, both will benefit. But because there is informational uncertainty about the growth of complementary industries, there may be under investment, leading to market failure. Tied to these claims, arguments about information inadequacy have been espoused by Dani Rodrik, who argues that IP is more about eliciting information from the private sector about a country’s comparative advantage than it is about creating the correct government intervention (Rodrik 2004, 2-3). The claim here is that it is difficult without complete information to ascertain which industries will have a positive future. In Pack and Saggi’s terms, «at the microlevel, entrepreneurs may simply not know what is profitable and what is not»¹⁰. Hausmann and Rodrik share this view and argue that comparative advantage must be discovered through a form of «experimentation» that depends on «strategic collaboration» between government and private sector; specifically, government would help private sector to «internalize the various externalities associated with the cost-discovery process and to provide many of the public inputs (standards, infrastructure, certification, property rights) that only the government can» (Hausmann and Rodrik 2003; 2008, 4).

2.2. *Economic and political goals*

We next turn to an examination of the variety of economic and political goals that states may wish to pursue, which do not fall easily into the category of «market failure» – although some analysts might see them as such.

¹⁰ Pack and Saggi (2006, 277). They refer to this problem as an information externality but a better label would appear to be incomplete or inadequate information.

Some are well known and have long been used as a rationale for government intervention. More recent are claims concerning the benefits of promoting green industries, both to address environmental degradation and as a new source of manufacturing jobs.

2.2.1. *Income distribution*

States can pursue industrial policy as a method of addressing income distribution issues, which can be caused by region, ethnic, or religious group. States are often under societal and political pressure to address problems of what some see as unequal income distribution. After a period of industrialization, countries often experience a significant increase in income inequality (Kuznets 1955); though this effect is temporary, in the short term governments may face pressure to resolve inequalities in the country. Industrial policy strategies have been effective in creating a more equal distribution of wealth and lower levels of inequality in both developed and developing countries. Governments can invest in infrastructure, education, and improved social services in targeted parts of the country that are relatively underdeveloped (e.g. rural vs. urban areas).

As an example, both China and India have suffered a wide income gap as a result of rapid industrialization in certain areas. In India, southern states have benefited from India's software boom over the past twenty years, leaving rural areas underdeveloped. China has similarly suffered disparities between its urban and rural residents, as well as regional inequity between inland and coastal cities. More recent legislation by both India and China has worked to address these disparities. In the case of India, the state has pursued measures to provide more Indians with access to social and financial services. In India these include horizontal policies such as targeted programs to help women and educate girls in schools, an electronic identity card to ensure among other things that subsidies go to their intended recipients, and a variety of rural employment schemes. In China, horizontal policies include a scheme to encourage 260 million Chinese migrant workers to become permanent urban dwellers – a policy that has met with some local opposition as well as criticism of «empty cities»¹¹.

In China, the disparity between the coastal regions and the western part of the country has led to the creation of a plan known as «Go West» in 2000, that led to the construction of highways, railways, educational programs and

¹¹ www.bloomberg.com/news/2013-08-10/china-must-address-migrants-needs-in-urbanization-advisers-say.html.

the like. Despite these efforts, significant disparities between eastern and western China still remain¹².

The issue of inequality often extends to ethnic or religious-based economic disparities. States will often promote preferential treatment for certain ethnicities or religions to correct for this problem. For instance, Malaysia gives preferential treatment to Malays in education, scholarship, business, loans, and housing to help its ethnic population and preserve their dominance in various areas. Such policies have come under fire for continuing past the original deadline of 1990 and persisting today (Pang 2013). Similar preferential policies exist in many other countries.

2.2.2. *International security*

Economists, while generally skeptical of deviations from free trade, have almost always agreed that some industries must be protected for reasons of national security. At the same time, industry lobbying groups have often framed their claims for protection in national security terms, knowing that the government may be more amenable to protection in such instances¹³. Some industries such as defense or the oil industry can make more valid claims about their importance. But even these claims can sometimes be suspect. For example, in the 1950s, the US domestic oil industry argued that imposing quotas on the import of Middle Eastern oil would increase American national security. By 1958, the industry had secured quotas on oil imports based on a national security argument, claiming that this trade policy would lead to energy independence for the US. While in the short run this may have been the case, the long-run effect of this policy was disastrous, since it led to the use of American over foreign oil reserves (Keohane 1984).

Rising tensions between the US and China have revived the practice of using security to advance industrial policy. In January of 2024, for example, the Department of Defense released its first National Defense Industrial Strategy. The Strategy explicitly mentions the DOD's fear of the «PRC's domination of critical markets» and advocates for supply chain decoupling alongside rebuilding the US industrial base¹⁴. This policy followed the passage of the 2022 CHIPS and Sciences Act which invested \$ 52.7 billion in domestic chip manufacturing. Underlying the decision to invest in domestic production were fears that foreign chip reliance could endanger national security. These

¹² http://www.atimes.com/atimes/China_Business/LG23Cb01.html.

¹³ The textile industry among others has often made national security arguments.

¹⁴ National Defense Industrial Strategy (2023). <https://www.businessdefense.gov/docs/ndis/2023-NDIS.pdf>.

developments signal a rise in citing national security concerns as an impetus to craft industrial policy.

In addition to national security claims, governments have often responded to intervention by other countries' IP efforts with either direct negotiations or by working through international institutions such as the WTO. Thus, although industry groups might press for government support, governments on their own may also be interested in ensuring that their industries face a level playing field, a topic we examine in Section 3.2.

2.2.3. *Rent seeking by governments*

Many bureaucrats across the world have engaged in rent-seeking behavior, motivated by personal rather than state goals. This involves extracting benefits for themselves from the private sector, which may sometimes, but not always, be tied to industrial policies. Even in cases in which industrial policy programs are ostensibly needed (e.g. climate investment in Bangladesh), corruption and embezzlement has frustrated implementation and the effective allocation of resources (Khan *et al.* 2022). Projects are left unfinished, poorly constructed, and underfunded because of politicians' actions (Khan *et al.* 2022). In addition, politically connected firms may be favored in government contract acquisition despite their inability to serve customers effectively, resulting in increased costs for governments and taxpayers (Khan *et al.* 2022). Other examples include India, in which ISI policies were often accompanied by large scale bribery as protected industries sought to ensure that such protection would continue. In other cases, such as Korea, corruption has taken place, but politicians facing external threats were more willing to siphon money slowly over time while allowing industries to prosper (Haggard 2004). Countries that have a primary advantage in extractive industries are generally more prone to such rent-seeking than those based on manufacturing or services. Local monitoring by the community can also assuage corruption and rent seeking in industrial policy contexts (Khan *et al.* 2022).

2.2.4. *Environmental*

Global warming has led to growing concerns about environmental sustainability and jobs, which states have tried to address through industrial policy. The United States, for example, has actively promoted green policies through providing subsidies and tax benefits to clean technology companies. In 2022 the Biden administration passed the Inflation Reduction Act to accelerate the transition to electric cars. This includes subsidies for the pur-

chase of electric cars, as well as support for more recent public and private efforts to meet the goal of 50 percent electric vehicle sales by 2030¹⁵.

In an effort to empirically evaluate whether governments had actually been using the financial crisis of 2008 as an opportunity to support «green industries», Aggarwal and Evenett (2009) empirically examined early trends in intervention. Their 2009 study showed that intervention was «actually helping smokestack sectors, relatively lower productivity sectors such as textiles and apparel, and agriculture [which] is hard to square with professed motives to promote economic growth and a «greener economy». In 2010, when Aggarwal and Evenett employed more sophisticated econometric tools in their analysis based on a longer time series, they found that there was indeed a newly developing bias toward green industries. As they note: «On the basis of these results, we cannot rule out that crisis-era discriminatory intervention appears to have been motivated by other considerations, including potentially the desire to promote new growth poles as well» (2010, 231). The upshot appears to be that countries have indeed been promoting some green industries, and the case studies in this work show that both the US and China actively promoted their wind turbine sector. Moreover, in the Chinese case, WTO constraints have *not* prevented the use of IP.

Although some analysts have criticized the industrial glut in solar panels and wind turbines (the former a subject of dispute between China and the EU), suggesting that IP was a failure, it is worth noting that while Chinese firms accounted for just under 50 percent of newly wind turbine capacity in 2006, by 2011 Chinese firms accounted for 96 percent of new capacity. Similarly, at the global level, in 2004, no Chinese firms were among the top ten global wind turbine manufacturers, but by 2013, four were in the top 10¹⁶. But even if one views the Chinese example as at least a partial success, as we do, the political economic requirements for pursuing such policies to secure market share are likely to prove daunting to most developing countries as we note in Section 4.

¹⁵ <https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/17/fact-sheet-biden-harris-administration-announces-new-private-and-public-sector-investments-for-affordable-electric-vehicles/>.

¹⁶ World Market Update: Executive Summary (2011). BTM Consult Available from <http://www.btm.dk/reports/previous+reports/world+market+update+2006+chinese/?s=39> and IEA, various reports.

2.3. *Rent seeking by firms*

Private firms may also exhibit «rent seeking» behavior or lobby the government to secure benefits that may have little to do with market failures or security considerations and avoid competition. With fewer competitors, either domestic or international, profits are likely to increase. Thus, firms are likely to use a host of non-market strategies to benefit themselves as opposed to solely focusing on market strategies to improve their competitiveness¹⁷.

In terms of tactics, the most common approach has been to lobby by framing the debate in terms of national security or health and safety concerns and use a grassroots approach to generate pressure. For example, the Korean agricultural sector has publicized these health problems by appealing to the press, summoning images of infected Pul-Kogi, a common Korean dish of barbecued beef. In addition, a candlelight vigil held in May of 2008 drew 2,500 protesters after the ban on beef was lifted¹⁸. Other tactics include direct lobbying of the government, testimony at hearings, legal strategies, and electoral efforts. These kinds of approaches can result in policies that have little to do with market failure or genuine security considerations.

3. STATE MANAGEMENT OF THE ECONOMY: STRATEGIES AND MEASURES

How can governments address market failures and pursue the various political goals and rent seeking? Neoclassical analysts argue that governments should only work to provide a good macroeconomic environment, focusing on stable monetary policy and responsible fiscal policy. But governments have not always followed this dictum, and have gone beyond basic macro policies to pursue both horizontal and vertical (sector-specific) industrial policies. We also separately consider the importance of global value chains in this section.

3.1. *Horizontal policy and instruments*

Horizontal policies are broad, as opposed to sector specific, and work to enhance the market without targeting specific industries. These policies are typically either economic incentives such as tax benefits and grants, or are development driven and encompass infrastructure and human capital improvement, or internationally focused. While these broad-based policies are

¹⁷ On non-market strategies and tactics, see Baron (2013).

¹⁸ *Fox News* (2008, 1).

generally more popular as they appear to benefit a wider constituency, these so-called horizontal policies often still do result in particularistic benefits for particular sectors or groups (Andreoni and Chang 2016).

3.1.1. *Domestic investment and tax benefits*

Horizontal policies include investment and tax incentives for growing businesses. These can include tax incentives for startups as well as government programs to sponsor certain areas of development. Another example of horizontal policies includes the provision of finance to specific type of firms. The most often used of these policies are small and medium enterprise (SME) development through tax incentives and access to capital. The United States has promoted SME policies for the past several decades, and President Obama has continued this trend by creating a \$ 30 billion small-business lending fund (The Economist 2010). Most other countries have similarly sought to promote SMEs, a policy which may have a sectoral impact depending on the relative size of firms in different industrial sectors.

3.1.2. *Development of human capital and physical and regulatory infrastructure*

Human capital development, though expensive and more difficult to implement than other horizontal policies, is one of the most effective approaches in the long run. The most important use of this policy is improving education. The Indian government established higher education institutions such as the Indian Institutes of Technologies, which have played an essential role in fostering the Indian IT industry. Other programs can include retraining programs for workers who have previously held jobs in industries that are no longer competitive. For example, the Korean government has helped farmers that lost their jobs as a result of the declining agriculture industry by creating educational programs to facilitate career changes.

Infrastructure development, both physical and regulatory, plays an important role in horizontal policymaking. Physical improvements can come through more efficient transportation networks, such as improved roads, highways, or canals, which reduce transportation costs internally. Infrastructure development in impoverished countries has included increased access to clean water and technology, which not only leads to more productivity but also increases consumption, which can help domestic markets grow. In terms of regulatory infrastructure, stronger law enforcement, clear rules and procedures, and a more efficient bureaucracy can help attract foreign direct investment. It also can allow domestic companies to spend less money on private

infrastructure (as in the case of India, with firms providing their own electric generators and water storage), allowing them to focus on product research and development, as well as marketing and sales.

3.1.3. *Foreign direct investment*

One of the goals of horizontal policy can be to create an atmosphere that attracts foreign direct investment. These include providing low-cost labor, creating tax incentives, and improved market access. A strong example of this is Hong Kong, which attracted a significant amount of investment by allowing foreigners to invest without burdensome restrictions. In addition, Hong Kong is known for protecting its investors' property and shareholder rights, as well as for providing highly advanced physical and regulatory infrastructure – policies that have been challenged since 2019 with more aggressive Chinese assertiveness over HK policies. These policies have led to Hong Kong and states that have followed similar methods to attract more investment. As we have seen, arguments about the creation of clusters and supply chains relies on attracting foreign investment. So on this score, having the right «investment» infrastructure is crucial to attracting capital.

3.2. *Sectoral Policies*

When one thinks of IP, the most attention has often been focused on sectoral policies. In debating how sectoral state intervention might be critical to development (albeit supplemented by coherent macroeconomic and horizontal policies), two approaches stand out. First, one strand of thought argues that government action is necessary, but only to the degree that it encourages a country's existing comparative and competitive advantage in the market. Second, another promotes a vision of state intervention wherein the government «leads» the market, encouraging policies that transform a country's existing comparative advantage to promote long-term growth.

3.2.1. *Conforming or defying comparative advantage?*

Robert Wade refers to state intervention to conform to the market as «following the market», where the government supports some of the bets of private firms (Wade 1990; Wade 2010, 155). Justin Lin, former Chief Economist and Senior Vice-President of the World Bank, is in favor of industrial upgrading through the «facilitating state». Such a state facilitates the pri-

vate sector's activity in areas of the country's comparative advantage (Lin and Chang 2009, 484). In a debate with Ha-Joon Chang, Lin discusses how by optimally tapping into a country's endowment structure (defined by the country's labor market, capital, and natural resources), the state can remove barriers to entry for firms in these industries. Conversely, Chang argues that the standard trade model (Heckscher-Olin-Samuelson, or HOS) is effective in short-term allocative efficiency, but not sufficient to explain medium or long run economic growth, failing to account for long term outcomes through assuming perfect factor mobility. Another weakness with the HOS model is that it assumes that there is one superior technology for producing a certain product that can be attainable once capital needs are met.

Ha-Joon Chang argues that state intervention must be about defying comparative advantage to upgrade a country's industry. States make investment decisions that private firms would not make, rather than supporting already successful industries (Wade 1990; Wade 2010, 155). Ha-Joon Chang discusses how comparative advantage-defying policies are necessary to promote long-term growth (Lin and Chang 2009, 501). In turn critiquing Chang, Lin describes efforts to lead the market as «comparative-advantage-defying» with high costs. In his view, implementing such a strategy requires significant protection and subsidization for firms that are not necessarily viable without government help. As a result, these firms may not provide any surplus, which can lead to greater difficulties in facilitating improvements in necessary capital and skilled labor over the long run (Lin and Chang 2009, 487).

3.2.2. Sectoral policy instruments

Whether market following or leading, instruments of intervention could include a host of measures. Sectoral IP has been utilized successfully in both middle income countries (e.g. China, Vietnam, Thailand) as well as in the United States (Di Tommaso *et al.* 2020). For example, countries have often sought to attract FDI through tax holidays for firms producing specific products or accelerated depreciation. Wade advocates incremental support, described as avoiding «open economy industrial policy», which can lead to developing economies losing their manufacturing industry. He cites China as an example of a country that refuses to level the playing field and instead keeping its currency undervalued to stay competitive (Wade 2010). Other measures that might be used include directing funding toward certain research priorities. Although this decreases researcher autonomy due to set outcomes and time constraints, such a shift may be beneficial for promoting or leading comparative advantage (Weiss 2005).

Strategic investments also can be used to promote innovation through providing and stimulating the availability of venture capital. Methods to promote the availability of such capital include financial incentives to VC providers (tax breaks and guarantees) or direct government funding (Weiss 2005). In addition, government procurement can be utilized as a tool to create national champions and support domestic producers, or as a lever to entice foreign suppliers to comply with national development efforts (Weiss 2005). States seeking early project development opportunities often provide incentives that would eventually benefit the industry it is championing. As a result, governments that attempt to lead the market often utilize government procurement.

Governments may use a host of other measures including the creation of government led companies or State Owned Enterprises (SOEs), direct subsidies to industry, or trade measures such as tariffs and quotas. Each of these measures has a set of potential problems including inefficiencies as in the case of SOEs that do not have to meet a bottom line, or excessive coddling of industries with a closed market to foreign goods that diminishes their incentives to become competitive. As we have seen, the Chinese have used government procurement as a key policy in many industries, as they have not yet signed the WTO Government Procurement Code.

Another potential sectoral instrument is encouraging agglomeration effects and industrial clusters. The work of Paul Krugman on agglomeration effects has been seen by many as an innovative rationale that goes beyond traditional market failure claims¹⁹. Krugman focuses on the importance of clusters, be they urban or regional, as a key element in driving industrial success. Moreover, as Baldwin and Krugman (1998) have suggested, the development of clusters can reverse the «race to the bottom» into a «race to the top». Developing countries have often competed with one another in attracting FDI by lowering tax rates and pardoning pollution infractions. Their work argues that because firms would rather locate in industrial clusters than remote locations, they may be less prone to exploit low tax rates and loose legal systems. Thus, governments – at least in theory – might be able to spend more on infrastructure, education, healthcare, and the like and a comprehensive industrial policy that promotes clustering would bring about more growth in developing countries.

Analysts such as Fan and Scott (2003, 297) draw on some of these and other claims noted in the previous subsections on market failure to argue that clusters can produce dense local labor markets, knowledge spillovers, and various forms of business organization and culture that can enhance

¹⁹ See Haggard (2004) for a discussion.

competitive advantage. In their view, geographical proximity increases efficiency and productivity, which, in turn, improves comparative advantage and eventually results in increased economic performance. Earlier work by Schmitz and Nadvi focused on clusters in developing countries, claiming that agglomeration effects can increase the likelihood of entrepreneurial activity given the dense interaction networks of such clusters (Schmitz and Nadvi 1999; Schmitz 2000, *passim*).

Yet as noted, industrial policies that make clusters a focal point for economic growth must be paired with horizontal policies targeting education and infrastructure – both physical and social. Investment in education is important for providing skilled labor as well as innovation at universities that have «dynamic learning capacities» (Fan and Scott 2003). Moreover, without a system of «social infrastructure such as legal, financial and intellectual property rights systems» (Kuchiki and Tsuji 2010, 3) to attract both foreign and domestic firms, success in promoting clusters is likely to prove ephemeral. The efforts by countries around the world to create «Silicon Valleys» speak to the widespread recognition of the benefits of such agglomeration, but the success rate of countries in achieving this goal has been relatively limited to countries that have a strong transparent government such as Chile.

In terms of approaches to dealing with national security, governments have often attempted to bolster specific sectors that are seen to be essential and tied to defense related concerns. Instruments that they use include the subsidization of specific industries, or the use of trade measures (such as quotas on oil, as noted above), and government procurement. As noted, as in the oil case, the government may end up helping industries to the detriment of national security despite industry claims to the contrary. In August 2022, in the context of increasing tensions with China, the Biden administration passed the CHIPS and Science Act to attract major foreign investment in semiconductor production and innovation. Already South Korea's Samsung has invested \$ 25 billion in Texas and Taiwan's TSMC has increased its investment in Arizona to \$ 40 billion with a second chip plant.

In terms of international negotiations, the US, among others, has often aggressively used trade instruments to help particular sectors. For example, in 1986, both because of pressure from the Semiconductor Industry Association and widespread concerns about the security implications of this sector, the US signed a semiconductor agreement with Japan. This accord guaranteed US producers a 20 percent market share in Japan and came in the wake of US antidumping actions against Japan. More recently, the US has promoted the so-called Chips coalition, with Taiwan, Japan, and Korea, to promote chip production and protect their intellectual property. It has also pushed the Netherlands and Japan to restrict the export of chip making equipment to China.

Intervention to help specific industries, be they for defense industries or other sectors, is thus likely to create conflicts with trading partners as with the recent tension with S. Korea in light of the importance of the China market for Samsung.

3.3. *Global supply chains*

Global supply chains are the primary manner by which low and middle income countries have been able to industrialize. In particular, GVCs «offered developing country firms access to knowledge, markets, and other valuable competitive assets» (Tagliani and Winkler 2016). As Gereffi has argued, the case of East Asia suggests that prospects for participation in a global commodity chain does not end at being «one link in the chain» but rather the possibility of «numerous links in the chain» or vertical integration (Gereffi 1999). As he notes, East Asia provides an example of moving «from assembly to full-package supply» over time while participating in the global value chain. Moreover, countries might be able to foster industrial upgrading when involved in a global value chain in order to follow their comparative advantage. However, these structures can also result in power asymmetries and the potential for coercion within the global value chain (Dallas *et al.* 2019).

In view of the key role played by multinational corporations in an increasingly globalized world, some have argued that governments may be able to help their firms participate in global supply (or value) chains as a way of developing their comparative advantage. Industrial policy through global value chains requires «more specific policies» to be successful; for example, «high-value agriculture needs water and cold chain infrastructure; and manufacturing requires easy access to foreign inputs» (Gereffi *et al.* 2019, 468).

Overall, it seems that participation, upgrading and vertical integration of global supply chains for a developing country can lead to economic growth. Yet in evaluating prospects for successful participation in supply chains, factors such as geographic location, a country's geopolitical situation, and domestic political economy, amongst others, affect whether the government can actually foster participation in global supply chains. For example, a study by Morrison *et al.* on global value chains concludes that the participation in supply chains ought to be combined with «local technological capabilities» to be successful.

Before turning to empirical examples, it is worth noting that if a country was able to develop *both* clusters and participate in a global supply chain, this might be seen as optimal. Yet fostering both elements can be challenging. As we have already seen, creating clusters along the lines of Silicon Valley is not easy; nor might the Valley's success be due to specific government

policies but rather to a serendipitous combination of universities, knock on effects from innovative companies, venture financing, immigration policy, and other geographical and political-economic factors that cannot easily be influenced by government policy.

In terms of examples of industrial upgrading that links both clusters and supply chains, China's efforts are particularly illuminating. Aside from the IP that promoted wind turbines and solar energy, the case of the auto sector speaks to the issue of strategies for industrial upgrading that is tied to both the issue of clusters and supply chains²⁰. As Oh notes, the Chinese insisted that foreign auto companies could only enter China in joint ventures (JVs) with Chinese state owned enterprises (SOEs) (Oh 2014). The government then used these JVs to promote parts exports as well as to supply the domestic auto market (and keep out imports). It also pushed industrial upgrading by insisting on high local content requirements *before* it joined the WTO in 2001.

4. INTERNATIONAL-LEVEL FACILITATORS AND CONSTRAINTS

We now turn to an examination of international political factors that facilitate or constrain industrial policy. First, we discuss how security threats increase the use of industrial policy measures. We then consider how international agreements might constrain industrial policy.

4.1. *Security threats*

Security threats have historically motivated industrial policy, especially among developing economies. Throughout the final decades of the 20th century, international threats motivated industrial policy by creating urgency to achieve economic development. Countries that face the risk of resource limitations in the shadow of great powers are good examples of this – for instance, Singapore has pursued economic development to reduce its dependence on natural resources imported from other countries. Some frame this as «systemic vulnerability», or the «simultaneous interplay of constraints» including «severe security threats», binding coalitional commitments and scarce resource endowments (Doner and Ritchie 2005, 329).

Traditional applications of IP for economic statecraft highlight the role of security threats and strategic competition for the development of industries important to national interest through *targeted* IP. Philippines and South Ko-

²⁰ This subsection draws heavily on Oh (2014).

rea, which are roughly comparable across bureaucratic structure and ideological cohesion, exhibit a difference in international threat perception that preempted Korea to pursue growth policies (Kang 2002). Throughout the 1970s, the South Korean government aggressively focused on building up its heavy industry under pressure from the North. The relationship between business and political power in an environment of strategic competition has been explored through tracing middle power maneuvering and great power strategic intervention in weaker states' security affairs. Similar studies highlight the catalytic role of systematic threats for elite coalition coordination, which is crucial for IP implementation (Maxfield and Schneider 1997). The competitive pressures and power structures of the global economy have shifted from the balance of power politics of the past, as security is ever more contingent on new and dynamic technological capabilities (Aggarwal and Reddie 2020). Technological threats stimulate government interest in military technology and motivate new industrial policy tools for horizontal reforms cross-industry competence.

The security literature also discusses industrial policy through the focusing on how states support technology diffusion across interconnected industries). This applies to both developed states with cutting edge technologies and developing economies balancing alliances. Great powers are now prioritizing defense technology and indigenous innovation capabilities in the national security dialogue. States like China, the United States, and Japan invest significantly in military defense innovation through comprehensive industrial policy reforms to promote civilian and military technology development. In the Chinese case, strategic development of dual track technology and civilian military integration (CMI) is targeted to rival the United States (Cheung 2017). China promotes integrated technologies as a cornerstone of a strategy to foster indigenous innovation, rather than IP only for defense-specific applications (Choung and Koo 2023). Indeed, China's efforts to promote export-oriented growth through the Made-in-China 2025 program have explicit links to security pressures which have been drivers of success and US policy responses.

New economic statecraft does not only apply to superpower competition; middle powers like India and Japan also use interdependencies to foster economic growth in strategic areas for defense, maneuvering between superpowers (Ahuja and Kapur 2018; Aggarwal and Kenney 2023). Cybersecurity, for example, is an emerging area for IP supporting technological development and innovation. Recent work has explored the rationale behind recent government intervention in cybersecurity markets, the driving forces behind policy adoption, and potential conflicts resulting from the pursuit of conflicting policy (Aggarwal and Reddie 2018). Yet others focus on the rise of strategic industrial policy in the UK cybersecurity market, and new emphasis on state-

led public private partnerships instead of market liberalization (Carr and Tanczer 2018).

Notably, security threats appear to elicit different effects on industrial policy across developmental contexts. Whereas little research focuses on how security threats affect established great powers like the United States, as these are often the instigators of security pressures, evidence from lower-income countries suggests that more developed countries have greater tools at their disposal to mitigate security pressures. One excellent example can be found in research on South Korea and Taiwan, showing middle powers' capacity to strategically link security threats like the rise of communism to shore up state authority and achieve developmental goals through industrial policy (Kay 2010). This is well-contrasted with extensive work on less developed cases, showing that security pressures without a strong central state lead to economic distortions and corroded capitalism (Dana 2020), or a concentration of IP risk in strict focuses on state-owned enterprises as the singular vector of state efforts (Singh and Chen 2018). While external threats may not alone determine policy success or failure, it is a motivating factor for states to pursue innovation and broader industrial policy for economic development.

4.2. *Global agreements*

At the international level of analysis, a key concern for policymakers is the shifting implications of WTO rulings over time; simply put, do WTO rules make IP impossible (Aggarwal and Evenett 2014)? Some analysts have accused developed countries which pursued IP of their own of «carving out a multilateral order which best suits their current development trajectory» (Weiss 2005, 723). While some have revived List's concept of «kicking away the ladder», arguing that developed countries «cement the head-start advantages of their firms through the WTO agreements» (Wade 2003, 633; Chang 2003), and pursuing IP which they pressure developing countries to avoid, others note that in the globalized economy, WTO constraints may be even more detrimental by inhibiting smaller states from connecting with global supply chains and receiving technology transfer (Kaur and Singh 2013).

Yet others argue that the Trade-related Aspects of Intellectual Property Rights (TRIPS), Trade-related Investment Measures (TRIMs) and General Agreement on Trade in Services (GATS) agreements hinder developing countries from implementing IP. TRIPS, which is the multilateral agreement on intellectual property, makes it more expensive for developing countries to receive a transfer of technology because of the overwhelming number of patents owned by developed countries (Wade 2003, 624). Conversely, some

argue that it is still possible for developing countries to have space available for local actors to «invent around» patents by designing patent laws that take into account «broader developmental objectives such as imposing stringent rules on disclosure and subsequently granting narrow patents, for example, or by allowing for wide-ranging research exceptions» (Shadlen 2005, 762). Although the WTO has ruled against explicit export subsidies and local content requirement, there is still room to maneuver with policies that less explicitly promote domestic firms (Kaur and Singh 2013).

Changes in the distribution of economic power have also eroded the developed world's influence in WTO negotiations. In particular, Brazil and India have led coalition building efforts during negotiations, while China has unilaterally used its economic power for agenda setting purposes (Hopewell 2015). More recently, developing countries have successfully advocated for preferential options in newly emerging creativity driven industries, despite struggles to develop robust and transparent business government networks with multinational firms (Shadikhodjaev 2018; Aggarwal and Reddie 2021). Some disagree that the WTO imposes a constraint rather than a lack of alignment between the WTO policy space and the economic growth in trade and investment sought by developing states (Cheung 2017). While WTO regulations limit the policy space, domestic challenges limit coherence and alignment with WTO compliance.

In light of this debate, analytical work has been undertaken on the extent to which seven major economies are complying with the WTO when they intervened in the aftermath of the 2008 crisis. In addition to observing variation in both discrimination against foreign firms and among domestic firms, the study found that countries vary in the degree to which they substitute for classic trade measure by using less regulated WTO rules such as «migration, bailouts and state aids, competitive devaluations, investment incentives, export taxes, trade finance, and steps by subnational governments and state-owned enterprises» (Aggarwal and Evenett 2012, 278). The authors note that this evidence «casts doubt on some of the strong claims in the industrial policy literature that WTO rules impose substantial constraints on government intervention, at least during the crisis era» (Aggarwal and Evenett 2012). The WTO has been a critical factor constraining IP, but after the confusion of the Doha round and growing power of LDCs, its role is shifting from creating to interpreting regulation (Milberg *et al.* 2014).

Here again, though, the average influence of global agreements on states masks important differences in effects across different developmental contexts. Recent research reiterates long-standing theory to show that, in developed economies, international agreements are obstacles to industrial policy in their capacity to tie the hands of state governments and limit the influence of rent-seeking lobbyists promoting sectoral IP (Xiaojun *et al.* 2020). Conversely,

in developing economies, the causal arrow reverses between industrial policy and international agreements. In cases such as Ethiopia (Hauge 2019), pre-developed South-East Asia (Chiengkul 2019), and broader cases of the global south research shows that industrial policy limits states' capacity to enter and negotiate terms of agreements, serving as a zero-sum trade-off for developing economies. Whereas more powerful states may rely on other levers of power like security threats and trade diversion to mitigate their trade-off (Athreye *et al.* 2020), less developed economies often see significant economic distortions from limited policy menus, typically relying on behind-the-border barriers that fall outside these agreements. Furthermore, this leaves less developed economies at the mercy of greater powers in global agreement talks that have proceeded since the Doha Round of WTO negotiations (Curiak and Singh 2015; Ye 2015), suggesting a generally unequal equilibrium of power in the context of global economic agreements.

4.3. *Regional agreements*

Regional arrangements such as the EU or ASEAN may also impinge on IP efforts. For example, the European Union's Competition Policy attempts to prohibit market distorting practices by national governments and firms operating in Europe. This competition policy involves legislation both restricting the scope of national government actions and limiting certain private sector operations²¹. Still, exceptions exist to this effort to discourage government aid in favor of firms, including aid to consumers that do not discriminate, damage caused by natural disasters, regional aid, cultural and heritage conservation. Regional trade organizations may allow for horizontal policy even if they limit sector specific policy or exacting concessions, allowing for some leeway depending on the developmental needs of states. At the same time, responding to the concerns about China, countries such France and Germany have begun to revive the idea of creating Europe-wide national champions and discouraging the EU Commission from blocking such efforts.

In the new industrial policy space, regional organizations provide a means for states to establish supplier networks with the BRICs as key economic hubs, again clarifying differences in more and less developed countries' IP effects of regional agreements (Milberg *et al.* 2014). For example, organizations like SADC and ECOWAS coordinate economic reform across states (Van der Ven 2017). However, the regional dynamics of neighboring powers may hamper state policymaking autonomy. Isaksen *et. al* discuss the challenges of facilitating regional structural transformation from a systems of inno-

²¹ European Union (2012). Official Journal of the European Union C326, 91.

vation perspective (Isaksen *et al.* 2018). They argue that it is most effective to combine systemic policy with firm-specific support, whereas if deployed individually both systemic and actor-based strategies will minimally affect developmental trajectory. However, systemic policy may not be appropriate for all actors in the region, and various regions will need locally tailored support to address the specific barriers to upgrading. When regions face similar IP challenges between states, regional organizations may help coordinate structural economic reform outside the possibilities afforded by unilateral intervention. Conversely, regional organizations that are dominated by powerful states whose economic strategy does not support the development of weaker, less developed neighbors may inhibit rather facilitate upgrading.

4.4. *Bilateral agreements*

Bilateral free trade agreements (FTAs) have also played an increasing role in constraining IP. Negotiations over FTAs often result in concerns over protectionist policies and subsidies that hinder market access across borders. For example, in negotiating the Korea-US FTA, both the United States and Korea attempted to protect certain industries through preferential policies. The US automobile lobby, led by Ford and GM, attempted to retain tariffs on Korean auto imports to the US to maintain a competitive edge. This resulted in the Korean agriculture industry lobbying heavily to protect rice production, despite Koreans paying five times the world price for rice as a result of this protectionism (LaMoshi 2003).

Broader research across cases has reiterated idiosyncratic findings like these by examining the constraints of bilateral agreements for IP implementation in cases of asymmetrical market size and in the context of newer issues than rice levees (Vidal *et al.* 2019). For example, some scholars argue that small states benefit from levying an environmental tax on large firms competing in international markets, with implications for middle powers struggling to enter global value chains in markets dominated by multinational firms from superpower states. Middle powers may have a legitimate need to subsidize the development of a certain technology yet are forced to implement the policies of neoliberal institutions to remain in the market, implying a sharp inequality in bilateral options across developmental contexts.

Although trade was the primary bilateral instrument for early industrializers like Japan and South Korea, investment has played a growing role in IP and technology transfer between established and emerging markets. Some scholars note the compatibility of indirect «soft» IP with bilateral trade and investment regimes, as these are key channels through which technology and information flow from greater to weaker powers (Harrison and Rodriguez-

Clare 2010). Outward foreign direct investment has long served strategic purposes to facilitate growth in emerging markets connected to supply chains driven by great powers (Shinn 2016). China's Belt and Road Initiative provides an example of strategic investment in infrastructure and industries now connected with Chinese supply chains. In this way, bilateral development investment creates both opportunities and constraints for small states aiming to upgrade.

An important difference here remains the general absence of bilateral agreements among countries in the global south, especially given the proclivity for developed states to use bilateral arrangements as hub-and-spoke power structures for asserting economic preferences on less powerful trade partners. Time and again, research has shown the ways in which bilateral arrangements are proposed, designed, and implemented under the near-unilateral stewardship of local hegemony in ways which co-opt the less powerful neighbors of greater economies (Ciuriak and Singh 2015; Ye 2015). This is further complicated by recent findings that South-South trade agreements generally only include deep, binding provisions when they are between countries who hold bilateral arrangements with greater powers in the global North (Gamso and Postnikov 2021), serving as spillover vectors for the preferences of great powers and further inhibiting the effectiveness of IP in the global south through regional and bilateral agreements.

5. DOMESTIC FACILITATORS AND CONSTRAINTS

State structures, particularly in terms of institutional strength and transparency, play a crucial role in the ability for governments to pursue IP (Maloney and Nayyar 2018). Drawing on the work of East Asian industrial policy analysts, scholars argue that the strong state in both Taiwan and Korea and the «industrial organization and financial and corporate structure in both countries were directly influenced by the politics of business-government relations» (Haggard 2004, 72). By extension, in the high growth East Asian countries, «political elites enjoyed a degree of political, organizational and economic independence from the private sector actors in the early phases of the region's growth, and this key political fact was reflected in institutional arrangements» (Haggard 2004, 72). Later scholarship highlights fractures in the developmental state typology, arguing that policies are a result not of autonomous state planning, but societal interaction between actors within domestic institutional environments (Moon and Prasad 1994; Whitfield and Buur 2014). In the case of emerging late industrializers, bureaucratic autonomy may even create opportunities for clientelism and cronyism that compromise the implementation of even robust IP (Doner and Schneider 2016).

Proponents of market intervention recognize the danger of clientelism as a form of government failure, noting that the state should impose performance conditions on industries in which it intervenes (Wade 2010, 158-159). Yet others terms this «tendency for subsidies to be dispensed in exchange for concrete performance standards with respect to output, export, and R&D» as «reciprocal control mechanism» (Amsden 1991; Amsden 2001) with some proposing to reduce government failure in IP by ensuring a collaborative environment between government and the private sector in pursuit of «fierce competition with strict accountability» (Cherif and Hasanov 2019) Such collaboration can include «deliberative councils, supplier development forums, investment advisory councils, sectoral round-tables or private-public venture funds» (Rodrik 2010). Because periods of heavy state involvement be understood to be short-term, and firms have incentives to pursue internal long-term growth to remain competitive or perish once such policies end, proponents argue that government incentives need to be temporary as well as based on performance.

The new IP literature emphasizes the flexibility of institutions to adapt policy for market conditions rather than favoring established business interests (Prodi *et al.* 2022). Political coalitions and related institutional structures play a key role in IP formation, implementation, and transition higher value aspects of technological development. Where governments fail to empower businesses groups in emerging industries, upgrading may stall and investment in key technologies may dwindle due to market uncertainty. Here, the role of the state and its institutions is to provide long term capital in industries necessary for development. New conceptions of the entrepreneurial state serve as a call to action for developed states which in recent years have failed to push forward the boundaries of innovation in critical areas like green technology and healthcare (Mazzucato 2013). Proponents argue that governments seldom receive credit for their economic contributions through early stage but are truly capable of leading the private sector in socially beneficial technologies (Mazzucato 2011).

However, institutional structures and the bureaucrats embedded within them play a crucial role in IP successes and failure (Di Tommaso *et al.* 2023; Di Tommaso 2020). The entrepreneurial state framework assumes that the state institutional structure supports innovation and stable provision of capital, with limited discussion of the politics surrounding policy (Mazzucato 2011). While the framework provides an ideal type for development in governments with established political structures, policy implementation hinges upon both structure and bureaucratic transparency. In new manufacturing, research shows that effects of human capital on upgrading depend on institutional quality along these dimensions, highlighting the implications of domestic state structure for policy success (Zhou 2018). Green technology policy

provides another interesting example of IP liable to capture by entrenched interests given its disruptive quality, with analysts arguing that energy transition demands an overhaul of sociotechnical systems, and state intervention to create effective, efficient, and legitimate renewable energy markets (Pegels 2018).

States like China and Germany have successfully implemented renewable energy policy and facilitated upgrading, with Germany struggling to maintain market share in the face of Chinese competition. Recent work connects China's industrial policy in renewable energy to strategic competition in sectors like electric vehicles, where high skill levels and cutting edge technology is critical to remain competitive in the market (Meckling and Nahm 2019). Renewable energy is important both from environmental and economic perspectives, and global powers like China have taken steps to upgrade industries against established competitors with the rise of green technology. Conversely, in late industrializing states, rent-seeking bureaucrats can undermine policy designed to facilitate upgrading. In Southeast Asia, this has posed a particularly difficult challenge for Thailand, Malaysia, and Vietnam as they struggle to upgrade from heavy industry to value added in line with Singapore and other NICs (Wong 2011). For example, Malaysia's renewables industry is fraught with coalitional politics favoring co-ethnic firms and the state-owned utility monopoly, and bureaucrats have failed to facilitate linkages between the domestic firms and multinationals dominating the export market (Doner *et al.* 2005).

Here again, we see important cleavages in the role of domestic facilitators and constraints across developmental context, hinging in this case primarily on the variation in government systems and economic structure. From the UK (HM Government 2017), to the United States (Hopewell 2017; Ngo *et al.* 2022; Di Tommaso *et al.* 2017), and to Japan (Shimada 2017), large and developed economies have iteratively leaned on familiar domestic political cultures, agendas, and policy tools to achieve balance between industrial policy and liberal market mandates. This freedom to link domestic policy demand with industrial policy goals is a unique privilege of developed states whose posture as «global economies» permits wide bandwidth for re-articulation of domestic constraints and use of domestic facilitators, primarily through creative coalition-building at the expense of trade partners.

This contrasts well with the difficulty of achieving such balance in less developed economies, where uncertainty of policy continuity, international shaming by larger powers, and mismatches between domestic capacity and sector-specific goals limit states' capacity to overcome constraints and leverage facilitators (Hevia *et al.* 2017; UNEP 2020). In rare cases like China, this difficulty has been overcome largely through highly-leveraged bets on competitive industries and fragmented buck-passing in decentralized efforts pushed

down to local levels, which afford national gains but more local losses contingent on policy outcomes (Xiaojun *et al.* 2020; Barbieri *et al.* 2019; Barbieri *et al.* 2020). Often, less developed economies suffer familiar traps of resource constraint which severely limit policy menus for brokering domestic facilitators and industrial policy goals to overcome constraints, as in all-too-familiar cases like oil dependence and island geography (Massi and Singh 2018).

In terms of the implications for countries seeking to pursue IP, the lessons are complex. Successful collaboration rather than self-interested defection will depend on the institutional context as well as on the extant power of business and government (Aggarwal and Reddie 2023). More practically, there is little to suggest that strong governments facing weak business groups have an incentive to create more powerful business groups. A political analysis of the interaction between state structure, and the interests of both state and private actors is critical to understanding the relationship between policy and outcome.

6. ELITE IDEOLOGICAL PREFERENCES

While state structures and institutions can guide policy and direct implementation, elite actors with agency and influence may imperil the implementation of well-designed policy. As the Washington Consensus faced economic challenges, scholars such as Dani Rodrik, Robert Wade, and others advocated a more nuanced approach to state intervention led by a coherent technocratic bureaucracy²². They argue that economic policy is inherently political, and that ideological coherence among policymaking elites is instrumental to successful IP. While some bureaucrats are truly committed to their mandate, others are willing to allocate resources to serve personal and political interests (Schneider 1991). Here, many believe the field has ignored the importance of leadership and politics in development.

In the current environment, ideological consensus around the optimal pathway to development through industrialization has clearly eroded. Even in China, where the state continues to intervene strongly, a debate has been taking place on the role of the state with China's sharp economic slowdown in 2023-2024, particularly with respect to addressing excessive state power that leads to corruption. Indeed, for the most part, few countries today have a strong ideological consensus on the level of intervention in which states should engage. This lack of consensus results from several factors. First, the success of China has thrown the pure neoliberal model of non-intervention into question. Second, it has been clear that much IP has led to inefficiencies,

²² See Johnson 1982 on MITI in Japan.

whereas states where the market has been allowed to work have had success in such industries as information technology. Third, the WTO has created a number of constraints on using IP, despite those constraints not proving as binding as some have suggested (Aggarwal and Evenett 2012). The current consensus is that states can successfully pursue IP, yet given the economic and political pre-requisites for success, ideological dissent on the benefits of IP prevails.

These views are particularly relevant to emerging consensus on new IP. In emerging markets with unstable elite coalitions, regulatory capture by business elites may hinder the implementation of successful policy in developed nations. While sector specific policy may be targeted and not require total state support, horizontal policy reforms most effective for industrial upgrading may be more difficult to implement with an ideologically fragmented elite. State policy to coordinate industries may face pushback from entrenched members of business communities who benefitted from older IP and may benefit less from new reforms focused on upgrading. This is evident in sectors from fossil fuels to manufacturing, where old interests face new challenges of upgrading in the globalized economy, angling for preferential policy treatment to maintain continued power and profitability of declining or internationally uncompetitive industries (Fabrizio 2013).

Where an entrepreneurial state uses patient capital and institutional stability as credible signals to investors in cutting-edge industry and technologies, states in the middle-income trap often lack certain aspects of the institutional strength, transparency, and accountability necessary to credibly reassure investors. Some observers note persistent inequality manifested by tension between businesses and labor impedes efforts to upgrade and develop skilled workforces. For example, India has struggled to successfully provide horizontal policy across a large and diverse population. Widespread corruption has led to challenges in facilitating structural transformation where China has seen success (Kaur and Singh 2013). Similarly, Malaysia gives preferential treatment to Malays in education, scholarship, business, loans, and housing to preserve the group's economic status; such policies have come under fire for continuing past the original deadline of 1990 and persisting today (Pang 2013). Recent scholarship highlights the deleterious effects of favoring co-ethnic domestic firms in the Malaysian case, since domestic firms have failed to upgrade and establish linkages with export oriented Chinese firms in related industries.

Aside from ethnic fragmentation as a disruptive force for elite coalitions, industrial change itself can distort the interests of policymaking elites. One example includes the South African and Malaysian experiences with renewable energy policy. Both states sought to implement a Feed-in-Tariff for renewable energy, but despite shared policy design, local bureaucrats faced challenges of

regulatory capture from unregulated domestic utility monopolies and fossil fuel interests looking to maintain their market share through manipulating government interests (Baker and Phillips 2019). Where interests of the domestic government are aligned with certain ethnic groups or class allies, policy is at risk of distortion. This is but one example from emerging states as to how industrial policy may fail at the implementation stage and illustrates challenges for disrupting entrenched interests in fragmented states.

Ideological dimensions again vary significantly across developmental contexts, due in no small part to a historical difference in the ideological underpinnings of development policy. Research shows that among middle powers serving as critical geopolitical allies like Turkey, great powers have been waging active ideological warfare to bring middle and smaller powers into new paradigms of development that challenge the existing neoliberal economic order (Kutlay 2020). Similarly, the rapidly changing developmental status of some countries like Brazil has been a driving factor in shifting perceptions of industrial policy which has shaped developmental efforts within these states over time (Roberts 2015). Notably, more static features like historical relationships between public and private sectors creates its own set of ideological constraints to industrial policy, especially in smaller economies with limited power on the world stage (Dana 2020; Whitfield and Buur 2014;). In line with prevailing research on elite-centered development (Selwyn 2016), this may be the most difficult limitation to IP in less developed economies.

7. CONCLUSION

As we have seen, industrial policy can foster economic growth, but must be practiced with great care. The most limited form of «industrial policy» is macroeconomic policy, which is essentially a *laissez faire* approach that combines monetary and fiscal policy to create a stable environment for industries to grow based on their own strengths and weaknesses in the global economy. The risk of following this method is that simply creating a more economically open environment may not be enough to realize real economic growth.

Horizontal policy requires greater intervention, and generally promotes industries that already have an advantage in the market through broad policies such as improved education and human capital development, stronger infrastructure development (whether financial or physical), or financial benefits. Finally, sectoral policy is the most involved, allowing the state to pick winners (and losers) by choosing which industries should have the most resources. The downside of these last two more intrusive methods are that the state can create policies that are initially beneficial, but can result in dependence and, eventually, capture.

TAB. 2. *Industrial policy issues*

Issue	Claim	Policies
Importance of manufacturing sector	Manufacturing is essential to develop comparative advantage and move away from reliance on commodities or is important in developed countries to provide jobs for middle class jobs	Both horizontal and sector specific policies to bolster the manufacturing sector (with aggressive trade and subsidy policies, among others, in the case of ISI)
Agglomeration effects or clusters	Clusters are the basis of rapid industrial transformation because of their spillover effects and interconnected factor markets	Horizontal policies to boost regions and possibly sector specific policies to promote specific industries in a cluster complex
Global supply chains	Working with multinationals in a global economy through positioning domestic firms in a global supply chain can promote growth and increase the benefits of foreign direct investment	Encourage multinationals to invest through good macroeconomic policies and horizontal policies. Promote industrial upgrading of existing domestic firms through a variety of horizontal and sector specific policies
Green industries	Green industries in both manufacturing and services should be promoted in view of environmental concerns that will drive high demand	Both horizontal and sector specific policies to target green focused industries

Source: Authors.

To better understand the new issues that are increasingly becoming a focus of the benefits or costs of IP, Table 2 examines both the claims that advocates of particular problems or types of industries promote as well as the policies that they believe will achieve their goals.

As we can see, different policies or market failures often require more than one type of policy (macro, horizontal, or sectoral), and at least theoretically, as we have seen in this article it is possible to substitute different policies to achieve the same goal.

As Section 3 noted, there is considerable debate about the appropriateness of IP. Some argue that macroeconomic policies should be sufficient, others call for horizontal policies, and yet others favor sectoral policies. With respect to the latter, there is an ongoing debate about whether governments should attempt to facilitate the pursuit of comparative advantage or actually defy a country's comparative advantage to create cutting edge products and services. Table 3 summarizes the key arguments on this score.

Our own view is that it is unlikely that sectoral policies can succeed in the absence of good macroeconomic and horizontal policies. The importance of these policies has often been lost in the debate on sectoral policies.

A crucial issue concerns the question of whether such policies, be they macro, horizontal, or sectoral, can be successfully *implemented*. To this end, column 1 in Table 4 summarizes the key factors that may facilitate or impede the pursuit of IP. More importantly, from a policy perspective, column 2 ad-

TAB. 3. *Economic factors influencing successful IP*

Policy Type	Specific Policies	Views in the literature
Macroeconomic	Monetary policy	General agreement on stability
	Fiscal policy	Deficit spending can be useful in crises, but excessive spending is inflationary
	Exchange rate policy	Almost all argue for stable exchange rates; some argue that undervalued rates help promote exports
Horizontal	Tax incentives	Generally seen as favorable
	Investment incentives	Good but can lead to overinvestment
	Financing for SMEs	Generally seen as positive
	Human capital development	Widespread agreement on benefits
	Physical Infrastructure	Widespread agreement on benefits
	Regulatory Infrastructure	Widespread agreement on benefits
	Policies to attract FDI	More controversy on this issue, particularly with concerns about excessive preferences for foreigners
Sectoral	None	Skeptics on the utility of sector specific industrial policy
	Follow comparative advantage	Increasing support for government as facilitator
	Defy comparative advantage	Controversy about the possibility that the government can useful lead firms

Source: Authors.

dresses the key question of whether these factors can somehow be influenced by policy elites. What do we find?

Although international threats appear to have played a historical role in facilitating IP (as in the case of South Korea or Taiwan), this «factor» is not subject to quick manipulation for the purpose of pursuing IP. As noted, international threats are generally a «given» and elites are unlikely to attempt to create such threats simply to promote IP. The WTO is another important player in how states pursue industrial policy through limiting protectionism. Some have argued that the rules of this organization are limiting the pursuit of IP. For example, analysts have been critical of the TRIPS and TRIMS agreements, as restricting developing countries scope of action with respect to IP. Yet the empirical evidence is much more mixed than at first glance. TRIPS may well enhance the prospect of IP, as governments are more confident that the intellectual property that they promote or that is developed by firms will be protected. TRIMS may

TAB. 4. *Political economy factors influencing successful IP and elite ability to affect factor*

Key facilitators or impediments for success	Can state elites affect these factors?
<i>International Threats</i> : May help countries develop IP when tied to other factors below	Only to a minor extent. «Diversionary war» may bolster domestic popularity, but elites are unlikely to «create» threats for IP purposes
<i>International Accords</i> : The WTO may constrain actors from undertaking IP in some cases. It might also be possible that adherence to WTO strictures facilitates IP (as in the case of respect for intellectual property rights that encourage firms to be more innovative in response to government initiatives)	If countries are members of the WTO and all its codes, they could be constrained in the pursuit of IP. Still, since many members do not sign all the codes (e.g. China and government procurement), and since all intervention measures are not constrained by the WTO, countries may have leeway in implementing IP
<i>Regional agreements</i> : Various regional accords (NAFTA/USMCA, EU, ASEAN) may have their own set of strictures aside from the WTO as to what types of policies are permissible	Changing views as well as lobbying by member states can alter what is permissible in regional accords
<i>Bilateral agreements</i> : As countries pursue bilateral agreements in view of problems in the WTO, some constraints on IP may be included in FTAs	Because many bilateral agreements involve asymmetric power, some states may be pressured into restricting their leeway in exchange for market access, particularly to larger economies
<i>Domestic structure</i> : State autonomy, balance between business and government, and administrative versus political separation are helpful	State structures and relationships are often historically determined and cannot readily be changed in the short run. State autonomy can lead to state rent-seeking rather than successful IP depending on other factors (1 and 3)
<i>Ideological consensus</i> : Coherence of views among relevant stakeholders helps in promoting IP	Appropriate consultation and debate may allow elites to develop a coherent vision of what types of horizontal and sectoral policies should be promoted

Source: Authors.

restrict the ability of the countries to engage in export promotion, using local content rules to promote industrial upgrading, or support cluster development. Yet as Aggarwal and Evenett (2012) have shown, countries may be highly resourceful in circumventing the strictures of the WTO. Empirically, we have seen that China, Brazil, and developed countries have all managed to implement IP without running afoul of the WTO. Similarly, countries have been creative in pressing for changes in regional accords, or in negotiating bilateral agreements to give them leeway in IP promotion.

State structures, on the other hand, play a significant role in whether or not a government is able to successfully pursue industrial policy. Strong states are better able to resist capture by lobbies, which is a major concern of practicing highly interventionist policy. As we have seen in East Asia, state independence combined with external threats and a strong developmental ideology, helped countries such as South Korea and Singapore among others to partially avoid clientelism.

In terms of policy, as Wade and others have noted, state elites should impose performance conditions on industries they support, and should en-

sure that power is evenly balanced to prevent corruption (Wade 2010). But the notion that elites may be willing to impose performance conditions or encourage a power balance is not a given. Such elites may just as easily be interested in extracting rents from business actors rather than promoting IP, particularly in the absence of international threats. Moreover, given the variety of countries that have succeeded in the global economy with quite different policies, few prospect for a single ideological agreement are on the horizon. Although some countries may achieve such a consensus, this process is likely to be long and drawn out, as even countries such as China face debates over the appropriate role of the state.

What is the take away from this analysis? On the whole, we believe that while international constraints only have a limited effect in preventing the use of IP, the most significant impediment to the promotion of successful IP revolves around a country's domestic political structure. Even countries that meet many of the requirements that we have discussed for the effective use of IP such as China and Singapore are increasingly facing challenges, both with corruption (in the case of the former) and concerns about fostering sufficient innovation in a rapidly changing global economy in the case of the latter. In general, successful IP hinges on forming policy that is dependent on the context (Andreoni and Chang 2019; Andreoni *et al.* 2019). In terms of policy making, setting time limits on support for industries, clarifying state goals, and ensuring that firms respond to market signals are all critical for the successful pursuit of industrial policy.

In short, while IP policies may well lead to the development of countries' economies – be they horizontal or sectoral policies – policymakers must be aware of the risks of regulatory capture. This may leave countries worse off than simply creating a positive atmosphere for businesses through carefully managed macroeconomic policies. At the same time, excessive concern about government failure may be overblown in some cases, and some forms of IP may foster growth and development. As with most policy advice, the careful design of policy proposals from both a political and economic perspective is essential to achieve success.

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